CHAPTER III
Affected Environment

The information presented in this chapter is a summary of the Affected Environment as it appears in Chapter III of the DEIS. Changes from the DEIS are also identified in this chapter. The gathering of information about the affected environment describes the baseline conditions of the study area. To begin gathering baseline information a study corridor was identified to serve as the limits of the study area. The study corridor was used to identify potential constraints and issues of concern. As Initial Concepts were defined for the project, the focus of analysis narrowed. The study team looked at what was referred to as the Initial Area of Investigation to assess impacts associated with each concept as they evolved into alternatives. In this chapter, the Initial Area of Investigation is the largest footprint of a combination of the alternatives examined in Chapter II. These are shown geographically on exhibits in Chapter III of the DEIS. The Initial Area of Investigation used within this chapter provides the baseline for determining the impacts associated with the project alternatives. The impacts associated with each of the project alternatives are discussed in detail in Chapter IV of the DEIS and are summarized in Chapter IV of this document.

A. Social and Economic Characteristics

1. LAND USE

The study corridor is located in the heart of the Kansas City metropolitan region and extends from just north of Missouri Route 210/Armour Road in Clay County, through North Kansas City, Missouri (Clay County) and along the north edge of downtown Kansas City, Missouri (Jackson County). The Missouri River separates the two cities with the city of North Kansas City located north of the river and the city of Kansas City located south of the river. It is characteristically an urban environment with very little undeveloped land. The existing land uses within the study corridor can be separated into eight general categories: single-family residential, multi-family residential, commercial, industrial, public/semi-public institutional, parks/recreation/open space, parking areas and transportation corridors. Within the study corridor, industrial land uses dominate in North Kansas City, whereas a variety of uses are found in Kansas City.

2. DEMOGRAPHIC AND SOCIAL CHARACTERISTICS

a. Population

Between 1990 and 2000 the study corridor experienced a slight decline in population while the cities, counties and the metropolitan area each experienced some level of growth during that same period. There is a higher percentage of minority individuals within the study corridor and Kansas City, Missouri than is seen in the populations of North Kansas City, the metropolitan area or statewide. Some of the highest percentages of minority individuals occur in the Columbus Park, Pendleton Heights, Parkview and Paseo West neighborhoods where a majority of the census blocks show more than 50 percent of the population to be minority.

b. Public Parks and Recreation Facilities

Table III-1 (Table III-5 from the DEIS) shows the Public Lands and Facilities. Table III-1 has been revised, as shown below, to show that River Bluff Park is a Section 6(f) resource, as a recipient of Land and Water Conservation Funds (LWCF). Approval of disbursement of LWCF funds for River Bluff Park, which is located at the northwest corner of the Loop, occurred in March 1973.

Table III-1*
Public Lands and Facilities

Name	City	Eligibility – Section 4(f) 6(f)
Public Parks & Recreation Areas		
River Forest Park	North Kansas City	4(f), 6(f)
Richard L. Berkley Riverfront Park	Kansas City	4(f)
Kessler Park	Kansas City	4(f), UPARR
Belvidere Playground	Kansas City	4(f), UPARR
Margaret Kemp Park	Kansas City	4(f)
Garrison Square	Kansas City	4(f), UPARR
Columbus Square	Kansas City	4(f)
River Bluff Park	Kansas City	4(f), 6(f)
Case Park/West Terrace Park	Kansas City	4(f)
Pedestrian/Bicycle Facilities		
Proposed Missouri River Levee Trail	North Kansas City	Not Eligible
Riverfront Heritage Trail	Kansas City	Not Eligible
On-Street Bike Routes (Planned/Proposed)	Kansas City/NKC	Not Eligible
Public Housing Common Space		
Guinotte Manor Common Space	Kansas City	Not Eligible
Other Publicly Owned Space		
Levees and Floodplains	North Kansas City	Not Eligible
Interchange Open Space (northwest loop)	Kansas City	Not Eligible
Seymour Rugby Park (southwest loop)	Kansas City	Not Eligible
Port Authority Development Site	Kansas City	Not Eligible
Green Space	Kansas City	Not Eligible
Miscellaneous Open Space	Kansas City	Not Eligible
Scenic Byways		
Spirit of Kansas City Regional Scenic Byway	Kansas City	Not Eligible
Cliff Drive State Scenic Byway	Kansas City	Not Eligible
Boulevards & Parkways		
Paseo Boulevard	Kansas City	Not Eligible
Admiral Boulevard	Kansas City	Not Eligible
Grand Avenue (Boulevard)	Kansas City	Not Eligible

* Table III-5 in the DEIS page III-12.

There have been no other changes in the information presented in the DEIS.

c. Pedestrian/Bicycle Facilities

This section provides further clarification on current bicycle and pedestrian policy and its affect on the I-29/35 Study Corridor.

The pedestrian/bicycle facilities located within the study corridor include sidewalks on side streets, off-street pedestrian/bicycle trails, and existing, planned and proposed on-street bicycle routes. Since the approval of the DEIS, Mid America Regional Council (MARC) has developed

a policy to address pedestrian/bicycle accommodations over major river crossings. The policy has not been adopted by MoDOT.

As a result of the comments received on the DEIS, MoDOT, in partnership with MARC, conducted a study to identify and evaluate potential bicycle/pedestrian facilities across the Missouri River in the downtown Kansas City area. Representatives from Kansas City, North Kansas City, KCATA, Missouri Bicycle Federation and FHWA were included on the study team. The study included conceptual designs that were of sufficient detail to facilitate discussions and decisions regarding reasonable alternatives for potential facilities. The analysis included federal, state, local and regional policies applicable to bicycle/pedestrian accommodations. MoDOT worked with MARC and the community to select one reasonable alternative that is the priority for the region to be included for construction in the 2008-2012 STIP.

Based on the outcome of this study MoDOT is committed to letting for construction a reasonable and safe bicycle/pedestrian facility crossing the Missouri River along Missouri Route 9 between 10th Avenue in North Kansas City and 3rd Street in Kansas City via the Heart of America Bridge by 2012. Since the study area in this NEPA document does not include Missouri Route 9 north across the Missouri River, the appropriate environmental documentation and clearances will be completed as the bicycle/pedestrian project moves forward.

3. ECONOMIC CHARACTERISTICS

The employment category with the greatest number of employees in the study corridor is manufacturing. The area with the lowest number of employees in the study corridor is agriculture, forestry, fishing and hunting and mining.

B. Natural Environment

1. AIR QUALITY

This section provides additional clarification on air quality evaluation policy and procedures.

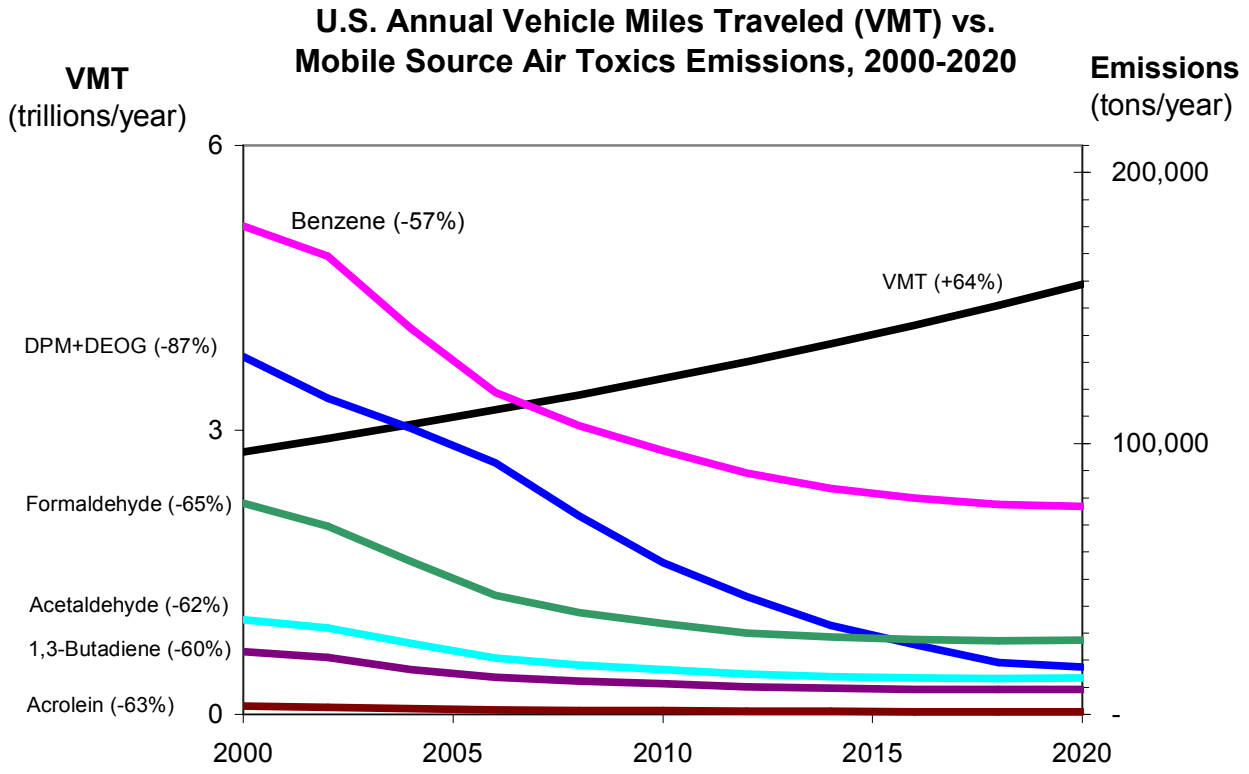
The I-29/35 Study Corridor is located within the Metropolitan Kansas City Interstate Air Quality Control Region (Missouri-Kansas) (AQCR #94). The Kansas City Metropolitan Area, Clay and Jackson counties, is currently in attainment status for all criteria. More detailed information on Missouri and National ambient air quality standards can be found in Table III-10 in the DEIS.

In addition to the criteria air pollutants for which there are National Ambient Air Quality Standards (NAAQS), EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners) and stationary sources (e.g., factories or refineries). Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the Clean Air Act. The MSATs are compounds emitted from highway vehicles and non-road equipment.

Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

The EPA is the lead Federal Agency for administering the Clean Air Act and has certain responsibilities regarding the health effects of MSATs. The EPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources. 66 FR 17229 (March 29, 2001). This rule was issued under the authority in Section 202 of the Clean Air Act. In its

rule, EPA examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline (RFG) program, its national low emission vehicle (NLEV) standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Between 2000 and 2020, FHWA projects that even with a 64 percent increase in VMT, these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 57 percent to 65 percent, and will reduce on-highway diesel PM emissions by 87 percent, as shown in the following graph:



Notes: For on-road mobile sources. Emissions factors were generated using MOBILE6.2. MTBE proportion of market for oxygenates is held constant, at 50%. Gasoline RVP and oxygenate content are held constant. VMT: *Highway Statistics 2000*, Table VM-2 for 2000, analysis assumes annual growth rate of 2.5%. "DPM + DEOG" is based on MOBILE6.2-generated factors for elemental carbon, organic carbon and SO4 from diesel-powered vehicles, with the particle size cutoff set at 10.0 microns.

As a result, EPA concluded that no further motor vehicle emissions standards or fuel standards were necessary to further control MSATs. The agency is preparing another rule under authority of CAA Section 202(l) that will address these issues and could make adjustments to the full 21 and the primary six MSATs.

a. Unavailable Information for Project Specific MSAT Impact Analysis

This EIS includes a basic analysis of the likely MSAT emission impacts of this project. However, available technical tools do not enable the prediction of project-specific health impacts relative to the emission changes associated with the alternatives in this EIS. Due to these limitations, the following is presented in accordance with CEQ regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information:

Information that is Unavailable or Incomplete

Evaluating the environmental and health impacts from MSATs on a proposed highway project would involve several key elements, including emissions modeling, dispersion modeling in order to estimate ambient concentrations resulting from the estimated emissions, exposure modeling in order to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project.

Emissions – The EPA tools to estimate MSAT emissions from motor vehicles are not sensitive to key variables determining emissions of MSATs in the context of highway projects. While MOBILE 6.2 is used to predict emissions at a regional level, it has limited applicability at the project level. MOBILE 6.2 is a trip-based model--emission factors are projected based on a typical trip of 7.5 miles, and on average speeds for this typical trip. This means that MOBILE 6.2 does not have the ability to predict emission factors for a specific vehicle operating condition at a specific location at a specific time. Because of this limitation, MOBILE 6.2 can only approximate the operating speeds and levels of congestion likely to be present on the largest-scale projects, and cannot adequately capture emissions effects of smaller projects. For particulate matter, the model results are not sensitive to average trip speed, although the other MSAT emission rates do change with changes in trip speed. Also, the emissions rates used in MOBILE 6.2 for both particulate matter and MSATs are based on a limited number of tests of mostly older-technology vehicles. Lastly, in its discussions of PM under the conformity rule, EPA has identified problems with MOBILE6.2 as an obstacle to quantitative analysis.

These deficiencies compromise the capability of MOBILE 6.2 to estimate MSAT emissions. MOBILE6.2 is an adequate tool for projecting emissions trends, and performing relative analyses between alternatives for very large projects, but it is not sensitive enough to capture the effects of travel changes tied to smaller projects or to predict emissions near specific roadside locations.

Dispersion – The tools to predict how MSATs disperse are also limited. The EPA's current regulatory models, CALINE3 and CAL3QHC, were developed and validated more than a decade ago for the purpose of predicting episodic concentrations of carbon monoxide to determine compliance with the NAAQS. The performance of dispersion models is more accurate for predicting maximum concentrations that can occur at some time at some location within a geographic area. This limitation makes it difficult to predict accurate exposure patterns at specific times at specific highway project locations across an urban area to assess potential health risk. The National Cooperative Highway Research Program (NCHRP) is conducting research on best practices in applying models and other technical methods in the analysis of MSATs. This work also will focus on identifying appropriate methods of documenting and communicating MSAT impacts in the NEPA process and to the general public. Along with these general limitations of dispersion models, FHWA is also faced with a lack of monitoring data in most areas for use in establishing project-specific MSAT background concentrations.

Exposure Levels and Health Effects – Finally, even if emission levels and concentrations of MSATs could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis preclude us from reaching meaningful conclusions about project-specific health impacts. Exposure assessments are difficult because it is difficult to accurately calculate annual concentrations of MSATs near roadways, and to determine the portion of a year that people are actually exposed to those concentrations at a specific location. These difficulties are magnified for 70-year cancer assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and

vehicle technology (which affects emissions rates) over a 70-year period. There are also considerable uncertainties associated with the existing estimates of toxicity of the various MSATs, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. Because of these shortcomings, any calculated difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with calculating the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against other project impacts that are better suited for quantitative analysis.

Summary of Existing Credible Scientific Evidence Relevant to Evaluating the Impacts of MSATs

Research into the health impacts of MSATs is ongoing. For different emission types, there are a variety of studies that show that some either are statistically associated with adverse health outcomes through epidemiological studies (frequently based on emissions levels found in occupational settings) or that animals demonstrate adverse health outcomes when exposed to large doses.

> *Exposure to toxics has been a focus of a number of EPA efforts. Most notably, the agency conducted the National Air Toxics Assessment (NATA) in 1996 to evaluate modeled estimates of human exposure applicable to the county level. While not intended for use as a measure of or benchmark for local exposure, the modeled estimates in the NATA database best illustrate the levels of various toxics when aggregated to a national or State level. The EPA is also in the process of assessing the risks of various kinds of exposures to these pollutants.*

There have been other studies that address MSAT health impacts in proximity to roadways. The Health Effects Institute, a non-profit organization funded by EPA, FHWA, and industry, has undertaken a major series of studies to research near roadway MSAT hot sports, the health implications of the entire mix of mobile source pollutants, and other topics. The final summary of the series is not expected for several years.

Some recent studies have reported that proximity to roadways is related to adverse health outcomes -- particularly respiratory problems[1]. Much of this research is not specific to MSATs, instead surveying the full spectrum of both criteria and other pollutants. The FHWA cannot evaluate the validity of these studies, but more importantly, they do not provide information that would be useful to alleviate the uncertainties listed above and they do not enable a more comprehensive evaluation of the health impacts specific to this project to be performed.

Relevance of Unavailable or Incomplete Information to Evaluating Reasonably Foreseeable Significant Adverse Impacts on the Environment, and Evaluation of Impacts Based Upon Theoretical Approaches or Research Methods Generally Accepted in the Scientific Community

Because of the uncertainties outlined above, a quantitative assessment of the effects of air toxic emissions impacts on human health cannot be made at the project level. While available tools do allow for the reasonable prediction of relative emissions changes between alternatives for larger projects, the amount of MSAT emissions from each of the project alternatives and MSAT

[1] South Coast Air Quality Management District, Multiple Air Toxic Exposure Study-II (2000); Highway Health Hazards, The Sierra Club (2004) summarizing 24 Studies on the relationship between health and air quality); NEPA's Uncertainty in the Federal Legal Scheme Controlling Air Pollution from Motor Vehicles, Environmental Law Institute, 35 ELR 10273 (2005) with health studies cited therein.

concentrations or exposures created by each of the project alternatives cannot be predicted with enough accuracy to be useful in estimating health impacts. (As noted above, the current emissions model is not capable of serving as a meaningful emissions analysis tool for smaller projects.) Therefore, the relevance of the unavailable or incomplete information is that it is not possible to make a determination of whether any of the alternatives would have "significant adverse impacts on the human environment."

b. MSAT Analysis

Given the emerging state of the science and of project-level analysis techniques, there are no established criteria for determining when MSAT emissions should be considered a significant issue in the NEPA context. Therefore, the FHWA has developed a tiered approach for analyzing MSATs in NEPA documents. Depending on the specific project circumstances, FHWA has identified three levels of analysis to analyze the six priority MSATs:

1) No analysis for projects with no potential for meaningful MSAT effects;
2) Qualitative analysis for projects with low potential MSAT effects; or
3) Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects.

The year 2030 forecasted traffic volumes for the I-29/35 Paseo Bridge project range from 95,000 to 145,000 depending on Alternative and roadway segment (Table II-6). Since only one roadway segment of the two eight-lane alternatives is above 140,000 ADT and this section represents only 10% of the total corridor length, the I-29/35 Paseo Bridge project is considered to be a project with low potential MSAT effects. This definition applies since the project does not meet any of the criteria set forth in 23 CFR 771.117(c), or 40 CFR 93.126 to be identified as an exempt project or one with no meaningful MSAT effects and the majority of the forecasted ADTs in the project corridor are less than the threshold of 140,000 to 150,000 ADT established for projects with higher potential MSAT effects.

This document presents a qualitative assessment of MSAT emissions relative to the various alternatives and acknowledges that all the project alternatives may result in increased exposure to MSAT emissions in certain locations, although the concentrations and duration of exposures are uncertain, and because of this uncertainty, the health effects from these emissions cannot be estimated.

As discussed above, technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this project. However, even though reliable methods do not exist to accurately estimate the health impacts of MSATs at the project level, it is possible to qualitatively assess the levels of future MSAT emissions under the project. Although a qualitative analysis cannot identify and measure health impacts from MSATs, it can give a basis for identifying and comparing the potential differences among MSAT emissions (if any) from the various alternatives.

The amount of MSATs emitted for each alternative in this EIS would be proportional to the vehicle miles traveled (VMT) assuming that other variables such as fleet mix are the same for each alternative. Because the estimated VMT under each of the Alternatives are nearly the same, (Table II-8) varying by less than 0.03 percent, it is expected there would be no appreciable difference in overall MSAT emissions among the various alternatives. Also, regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce MSAT emissions by 57 to 87 percent between 2000 and 2020. Local conditions may differ from these

national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

The additional travel lanes contemplated as part of the project alternatives will have the effect of moving some traffic closer to nearby homes, schools and businesses; therefore, under each alternative there may be localized areas where ambient concentrations of MSATs could be higher under certain Build Alternatives than the No-Build Alternative. The localized increases in MSAT concentrations could be most pronounced along the expanded roadway sections that would be built from the northern terminus to Independence Avenue with the North Subcorridor and River Crossing Subcorridor (all Alternatives) Build Alternative. However, as discussed above, the magnitude and the duration of these potential increases compared to the No-Build Alternative cannot be accurately quantified due to the inherent deficiencies of current models. In sum, when a highway is widened and, as a result, moves closer to receptors, the localized level of MSAT emissions for the Build Alternative could be higher relative to the No-Build Alternative, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Some minor decreases in localized MSAT concentrations could be experienced at the west end of the project were ramps are being eliminated or relocated in the vicinity of Broadway with Alternative A of the CBD North Loop Subcorridor. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.

A hot spot air quality analysis was not required because the 2003 regional transportation plan and the Transportation Improvement Program (TIP) conform with the State Implementation Plan (SIP). Typically hot spot analysis is only done when there is significant delays and idling.

2. NOISE

Existing noise level measurements were conducted on March 3, 2005 at representative sites in the study area. This information was then compared with the modeled noise levels to confirm the applicability of the model to the project. Information about measured and modeled noise levels for the study corridor can be found in the DEIS. A discussion of vibration can also be found in the same section of the DEIS.

3. PHYSICAL SETTING

a. Physiography and Topography

The study area is also located at the border of the dissected till plains (north) and Osage Plains (south). The study area topography can be generally characterized with the north half of the project as the nearly level alluvial plain of the Missouri River from M-210 to Front Street and for the south half, or CBD Loop portion, as gently rolling upland loessial hills.

b. Soils

The soils of the uplands are characterized as loess and soils derived from weathering of loess, and to a lesser extent, residual soils formed from the long term weathering of the underlying bedrock materials. Soils of the alluvial plain are characterized as sandy and silty, with lesser amounts of clay.

c. Geology

Over past geologic time, at the ends of glacial periods, the Missouri River yielded vastly greater flows (melting glaciers) at a steeper gradient (lower sea level). Thus, the river eroded the underlying Pennsylvanian Age bedrock to approximately 100 feet (30.5 meters) below the present ground surface. After the last glacial period, flows ebbed, sea levels rose, and gradients shallowed, allowing the river to fill the former deep, wide, valley with a layer of mostly sand, forming a nearly level five-mile (8-kilometer) wide plain.

The thickness of the alluvial material can vary from about 85 feet (25.9 meters) to as deep as 185 feet (56.4 meters). The alluvium is mostly composed of loose to medium dense poorly graded sand (SP), with mixtures, lenses and layers of clay, silt, and gravel.

Over the entire floodplain, and especially in the deeper bedrock areas, typically, a layer several feet thick of cobbles and boulders exist above the bedrock. The underlying bedrock is of the Pleasanton Group, Missourian Series, Pennsylvanian System. The Pleasanton is composed of mostly shale with minor amounts of sandstone, channel fill sandstone, very thin limestone layers, thin coal beds, and under clay layers. The Marmaton Group underlies the Pleasanton and is very similar in composition, especially in the upper portion of the group.

The upland area south of Guinotte Street (along the north side of Kessler Park) is characterized as loess covered bluffs adjacent to the flood plain. The underlying bedrock of the Kansas City Group is a sequence of layers of mostly limestone with interbedded shale layers.

The geology information contained in the DEIS was written with emphasis on the river crossing. This information has been confirmed by recent borings. A full scale geotechnical investigation will be performed in association with the design of the I-29/35 bridge.

Mining

No past or present mining is noted in the study area. However, sand is dredged from the Missouri River.

Seismic Hazards

The study area is located and classified according to the American Association of State Highway and Transportation Officials (AASHTO) as Seismic performance Category A – requiring no special seismic design considerations.

4. WATER RESOURCES

a. Streams

The streams within the study corridor include the Missouri River, the North Hillside Drainage Ditch, and an unnamed tributary to the North Hillside Drainage Ditch. There is also an unnamed drainage ditch (appearing to be ephemeral) located just north of 16th Avenue on the east side of I-29/35. It has a channel with an ordinary high water mark, but it has no direct connection to a water of the U.S. A letter from the U.S. Army Corps of Engineers (USACE) indicated that the unnamed drainage ditch is hydrologically isolated and not directly connected to a water of the U.S., therefore designating it as non-jurisdictional and not regulated by the USACE (see letter dated May 26, 2006 in Appendix G).

b. Wetlands

Vegetated wetlands within the study corridor are minimal since much of the study corridor is situated in urban built-up land. There is only one area shown on the National Wetlands Inventory (NWI) maps that is classified as a vegetated wetland. This area is the palustrine forested wetland system (PFO1A – palustrine forested, broad-leaved deciduous, temporarily flooded) located on the north side of the Missouri River, between the river and the levee. A portion of this NWI area, on the east side of the existing bridge, was investigated in the field and was determined not to be a jurisdictional wetland.

In addition to the mapping sources listed above, data was also gathered from Natural Resources Conservation Service (NRCS) soil survey maps to determine the presence or absence of hydric soils. This data indicated that the area along the north bank of the Missouri River and the area north of 16th Avenue (east side of I-29/35) contain soil with hydric inclusions in the portions that are frequently flooded. No other areas within the study corridor contain hydric soils or soils with hydric inclusions.

Field investigation resulted in the discovery of two vegetated wetland areas located in depressions north of 16th Avenue, on the east side of I-29/35. Neither of these wetlands is shown on the NWI maps. One is a 0.27-acre emergent wetland located to the north of the unnamed drainage ditch in this area. The source of hydrology comes from overland flow from the highway embankment on the west and to the north, and from the industrial trailer storage yard on the east. It is a poorly drained area and any outflow travels to the unnamed drainage ditch to the south of the wetland area.

The second wetland is a 0.02-acre forested wetland containing only a few cottonwood trees. It is located in a depression near the south end of the unnamed drainage ditch, just north of 16th Avenue. The source of hydrology comes from ditch flow from the north, and from the culvert under 16th Avenue that flows into the unnamed ditch on the west side of the wetland area. However, the ditch outflow culvert at the west end of the ditch is plugged with debris and sediment, and the water backs up, resulting in a poorly drained area.

There is also a narrow band of fringe emergent/forested wetland around the perimeter of a detention pond (the NWI designation of the pond is PUBGx) located within the 16th Avenue loop ramp. The emergent wetland portion covers 0.02 acre around the west perimeter of the pond and the forested wetland portion covers 0.02 acre around the east perimeter of the pond).

The USACE determined that the one stream and three wetlands referred to in the above text are hydrologically isolated and not directly connected to a water of the U.S., therefore designating them as non-jurisdictional and not regulated by the USACE (see letter dated May 26, 2006 in Appendix G).

c. Ponds

The NWI maps indicate one palustrine “unconsolidated bottom” (PUB) system within the study corridor; a detention pond (receiving run off from the highway and inflow from two culverts) located inside the 16th Avenue interchange loop in North Kansas City. A windshield survey also discovered another small detention pond (not on the NWI maps) located in North Kansas City on the west side of I-29/35 (outside of the existing MoDOT right of way), just south of 19th Avenue. This pond receives run off from a paved parking area to the west and is usually dry between storm events. The 16th Avenue detention pond contains a narrow fringe wetland around its perimeter (as described above in the wetlands section), but neither of the ponds has a stream channel flowing in or out of it. Since there is no hydrologic connection to a water of the U.S. they are not under USACE jurisdiction (see letter dated May 26, 2006 in Appendix G).

d. Floodplains

Streams located in the study corridor which have designated floodplains include the Missouri River, the North Hillside Drainage Ditch, and an unnamed tributary to the North Hillside Drainage Ditch (see DEIS Exhibit III-6).

Unnamed Tributary to North Hillside Drainage Ditch

At the north end of the study corridor, I-29/35 crosses (via a culvert) an unnamed tributary north of the levee that runs generally from northwest to southeast. Although there is no floodplain data available at the I-29/35 crossing location, the immediate upstream floodplain width is approximately 150 feet (45.7 meters). At the River Forest Park area the floodplain width increases to approximately 460 feet (140.2 meters). This tributary does not have a regulatory floodway.

North Hillside Drainage Ditch

Also at the north end of the study corridor, I-29/35 crosses (via a culvert) the "North Hillside Drainage Ditch" as labeled on the city of North Kansas City FIRM. This tributary runs parallel to the north side of the levee north of Armour Road in North Kansas City. On the east side of I-29/35, this tributary has a floodplain width of approximately 150 feet (45.7 meters), consisting of grass on the levee side, and shrubs and trees on the north side of the tributary. On the west side, there is a more extensive floodplain area of approximately 915 feet (278.9 meters) in width, which is located in a multi-family and single-family residential area. Even though this stream has water surface elevations identified on the FIRM, existence of a regulatory floodway has not been confirmed.

Missouri River

The I-29/35 Study Corridor crosses the Missouri River (via the Paseo Bridge) at river mile 364.8. At this location there is a levee on each side of the river. The 100-year floodplain is approximately 1350 feet (411.5 meters) wide and the regulatory floodway is approximately 1500 feet (457.2 meters) wide. The floodway width exceeds the floodplain width because the floodway includes the foot print of the levees, while the floodplain only reflects the actual width of inundation. Within the floodplain, there is a wooded riparian area on the north side of the river.

5. WATER QUALITY

The study corridor is located within the Lower Missouri-Crooked watershed (Hydrologic Unit #10300101). The surface water resources in the study corridor were discussed previously in Section 4, Water Resources. The quality of these resources varies depending upon factors such as water permanence, type of shoreline/bank and surrounding vegetation, substrate, presence or absence of in-flowing streams, and surrounding land use. In this type of urban environment, major concerns include channelization or other alteration of natural stream channels, construction site erosion, and residential and commercial use of pesticides and fertilizers. All surface runoff in the study corridor eventually flows into the Missouri River.

The groundwater level may be very near the surface in the alluvium. Source and recharge of the alluvial groundwater is almost entirely from the Missouri River. The groundwater table fluctuates directly with the river levels as there is a direct interchange between the river and the alluvial groundwater. The alluvium is considered very permeable with the ability to produce a large amount of groundwater.

The entire study area relies on public water supplies. Water is supplied by the city of North Kansas City, Missouri and the city of Kansas City, Missouri. The cities of North Kansas City and

Kansas City have water supply wells constructed at two separate sites in the alluvium between 0.5 miles (0.8 kilometers) and two miles (3.2 kilometers) from the I-29/35 centerline. Kansas City also has a river water intake at the same site. Sanitary and storm sewers serve the entire area.

In the uplands, various shallow perched groundwater levels exist in the soil and bedrock. Deeper regional groundwater is present in the Pennsylvanian bedrock; however, due to dissolved solids it is non-potable and known as the Saline Ground-Water Province. Due to the low permeability of the Pennsylvanian strata, very little groundwater movement or recharge occurs.

6. BIOLOGICAL RESOURCES

The majority of the study corridor is comprised of urban built-up land. The most dominant vegetative natural communities occurring in the study corridor, although few, are the remnant upland and riparian forests (wooded areas). Grassed areas are predominantly composed of maintained cool-season grasses in residential and commercial/industrial areas. Wildlife, although not abundant, does exist in the study corridor, and potential habitat for threatened and endangered species exists.

Correspondence was conducted with the USFWS (see letter dated January 22, 2004, in Appendix G of the DEIS) concerning species listed as federally endangered or threatened that could occur in or near the study corridor. Correspondence was also conducted with the Missouri Department of Conservation (MDC) (see letter dated January 9, 2004, in Appendix G of the DEIS) and information was obtained from the MDC's Natural Heritage Database to see if there are any rare species or rare natural communities that have been known to occur in or near the study corridor. Although there were no known locations or recorded occurrences directly within the study corridor, some occurrences were recorded near the corridor. It was determined that the following species could potentially occur in the area:

- ***Bald Eagle* (*Haliaeetus leucocephalus*)** *(Threatened on the federal level, Endangered on the state level)* – Although the wooded corridor on the north shore of the Missouri River provides potential bald eagle nesting or roosting habitat, there are currently no known or recorded locations of bald eagle nests or roosting areas within or near the study corridor.

- ***Pallid Sturgeon* (*Scaphirhynchus albus*)** *(Endangered on both the federal and state level)* – The pallid sturgeon's primary range and habitat is in the Missouri River, but it can also occur in the Mississippi River downstream of its confluence with the Missouri River. It is a bottom-dwelling fish that prefers the turbidity and swift current of the two rivers and locations with a firm sand bottom. In Missouri, the spawning season runs from June 1st to August 1st.

  According to the USFWS, the pallid sturgeon has been captured in tributary mouths, over sandbars, along main channel borders and in deep holes, which can provide overwintering habitat. In addition, small pallid sturgeons have been captured in off-channel, shallow water areas. Deep holes can include scour holes behind bridge piers and at wing dike or L-dike tips where scouring takes place. Hydrographic surveys (dated 1994 and 1999-2000) which determine water depth, aerial photography (flown March 2002) and field observations (October 2004) indicate a combination of scour holes, structures such as wing or L-dikes, and sandbars which can provide an appropriate habitat complex for the pallid sturgeon. According to the MDC, in 1979 there was an occurrence of the pallid sturgeon west of the study corridor near the Broadway Bridge, which is approximately a mile and a half upstream.

MoDOT conducted a hydrographic survey on the Missouri River at the Paseo Bridge location in March 2006 to obtain more up-to-date information than the 1994 and 1999-2000 studies. The survey was conducted to determine whether potential habitat exists within a 250 foot area that included the existing Paseo Bridge and the area within the proposed right of way on the east side of the bridge. Recent capture data for pallid sturgeons in February and March 2006 were for sampling stations monitored by the Missouri Department of Conservation. These recent captures were approximately 20, 30, and 40 river miles downstream of the project area at the Paseo Bridge. Information about the lack of habitat diversity within the project area has been shared with USFWS as part of an informal coordination effort on this issue. See MoDOT letter dated June 15, 2006 in Appendix G.

- ***Peregrine Falcon (Falco peregrinus)*** *(Endangered on the state level)* – The peregrine falcon has historically nested on cliffs, but it has also adapted to nesting on tall city buildings where pigeons, their primary source of food, also occur. The MDC's Natural Heritage Database indicated that a peregrine falcon nest site exists on a tall building in the downtown Kansas City area, just south of the study corridor.

Annually, the MDC publishes the Missouri Species of Conservation Concern Checklist (MSCCC), which is a list of rare plants and animals in the state. These species are given a "state rank", according to rarity, and those with a rank of 1, 2 or 3 are "species of conservation concern". To avoid violating state statutes, MoDOT considers these species during the project planning process. A brief explanation of each ranking is as follows:

- S1 – Critically imperiled (typically five or fewer occurrences or very few remaining individuals)
- S2 – Imperiled (six to 20 occurrences or few remaining individuals or acres)
- S3 – Rare or uncommon (21 to 100 occurrences)

According to the MSCCC the pallid sturgeon and the peregrine falcon are ranked S1 in the state and the bald eagle is ranked S3. All three species are endangered on the state level as discussed previously. The silver chub *(Macrhybopsis storeriana)* and the sturgeon chub (*Macrhybopsis gelida)* are ranked S3 in the state and have been observed in the Missouri River. The silver chub has been observed in the river east of the study corridor and the sturgeon chub has been observed in the river northwest of the study corridor.

7. CULTURAL RESOURCES

The proposed construction work on I-29/35 within Kansas City, Missouri could result in unavoidable impacts (or destruction and visual effects) to recommended significant cultural resources and existing National Register of Historic Places (NRHP) properties and districts. Cultural resources include all prehistoric and historic archaeological resources, as well as buildings, structures, objects, sites and districts. Of these resources, only those associated with significant persons or events in history or prehistory, that exhibit significant architectural features, or which could provide valuable new information, are deemed significant (National Register Bulletin 1995). The cultural resource investigations were performed according to the scope of services prepared by MoDOT. The cultural resource investigations consisted of an archival search, an architectural survey, and an archaeological evaluation.

Previously recorded properties within the cultural resources Area of Potential Effect (APE) include four NRHP properties, two National Register Districts, and three not registered districts and one Multiple Property Survey: the 14th Avenue Historic Industrial District, Columbus Park, Central Business District, and the Historic Colonnade Apartments of Kansas City, Missouri Survey.

Within the APE, a total of 278 properties and 37 bridges were examined and assessed for historical significance. From these, a total of 121 properties were built before 1945 and 27 bridges built before 1961 were recorded. All previously recorded properties were reviewed during the architectural survey. There were two bridges that no longer existed and 12 properties that were no longer there. All other previously recorded cultural resources were outside the APE.

Of the architectural properties recorded during the course of the survey, a total of eight were individually eligible for the NRHP. Another three architectural resources comprise one NRHP-eligible historic district. In addition, three bridges are considered individually eligible for the NRHP. All of these, except for Kessler Park, were a part of the State Historic Preservation Office's (SHPO) concurrence with MoDOT's recommendation on March 29, 2004 that these resources were eligible for the NRHP. Kessler Park was submitted by MoDOT to the SHPO on May 26, 2005 and the SHPO concurred on June 20, 2005 that Kessler Park, as described in the submittal, was eligible for the NRHP. The area of Kessler Park that is considered eligible for the NRHP is not within the APE although other areas of the park are within the APE. There are 59 properties within the APE that contain areas of archaeological interest. Should any of the 59 properties be impacted by the project, they will be evaluated for significance and based on that significance, appropriate measures will be undertaken.

Cultural resources in the proximity of the corridor were part of the information presented to the public. Coordination also took place with local authorities regarding all aspects of the project, including cultural resources. The only public comments related to cultural resources were those received from Kansas City, Missouri, Board of Parks and Recreation Commissioners on the subject of the Paseo Boulevard. The historic status of the Paseo parkway was examined as well, however the historic sections are located beyond the APE for the Paseo Bridge project. There were no other public or agency comments related to cultural resources. Further evaluations will be conducted in accordance with the stipulations set forth in the Memorandum of Agreement found in Appendix F of this FEIS.

8. HAZARDOUS WASTE

A Phase I hazardous waste assessment was conducted for the I-29/35 Corridor. The purpose of the waste assessment was to identify sites within the study corridor that are contaminated or potentially contaminated with hazardous materials or waste. Sites containing excessive solid waste were also screened.

Within the Initial Area of Investigation, 44 sites were identified as having the potential for hazardous or solid waste contamination. These sites (and their potential severity) are listed in Table III-23 of the DEIS and are located on Exhibit III-8 of the DEIS. State and federal agency lists document 41 of the 44 sites. The three additional sites were added from the field reconnaissance.

9. VISUAL QUALITY

The visual impacts of a project may be quite varied in different areas of a project corridor because the areas themselves can be visually distinct, can exhibit unique and consistent visual characteristics, and can possess varying degrees of visual quality. The study corridor can be divided into separate areas or units within which there are consistent visual characteristics and a uniform visual experience.

The identified visual assessment units present within the study corridor and the relative existing visual quality rating of each (on a scale of low, moderate, or high) is presented in Table III-24 of the DEIS.

Chapter III Exhibits

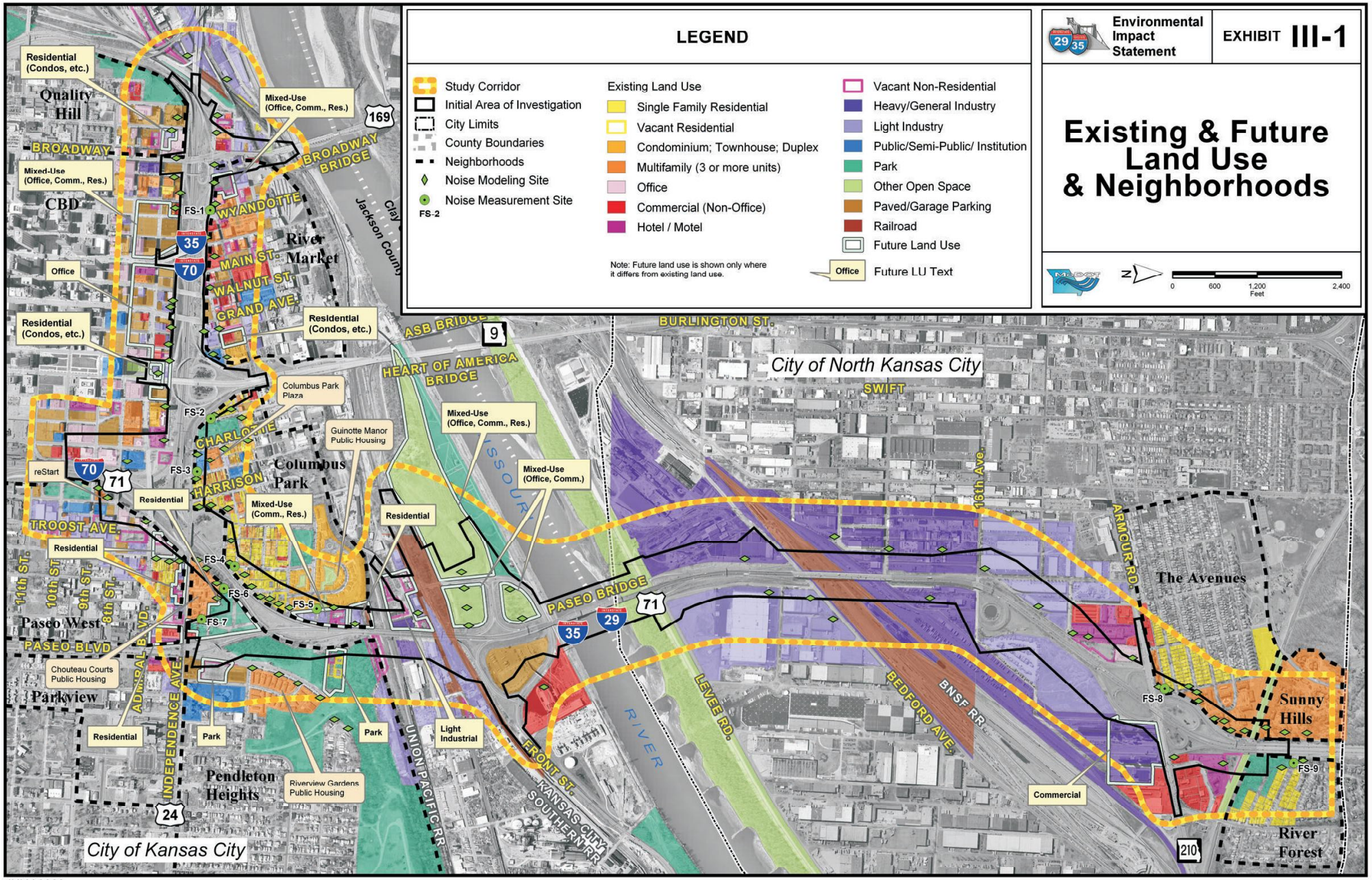
The Draft EIS contains the following Exhibits:

- Exhibit III-1 Existing & Future Land Use & Neighborhoods
- Exhibit III-2 Council Districts and Planning Areas
- Exhibit III-3 2000 Census Tracts
- Exhibit III-4 Population & Minorities
- Exhibit III-5 Parks & Other Public/Semi-public Facilities
- Exhibit III-6 Land and Water Resources
- Exhibit III-7 Cultural Resources
- Exhibit III-8 Hazardous Waste Sites
- Exhibit III-9 Visual Assessment Units

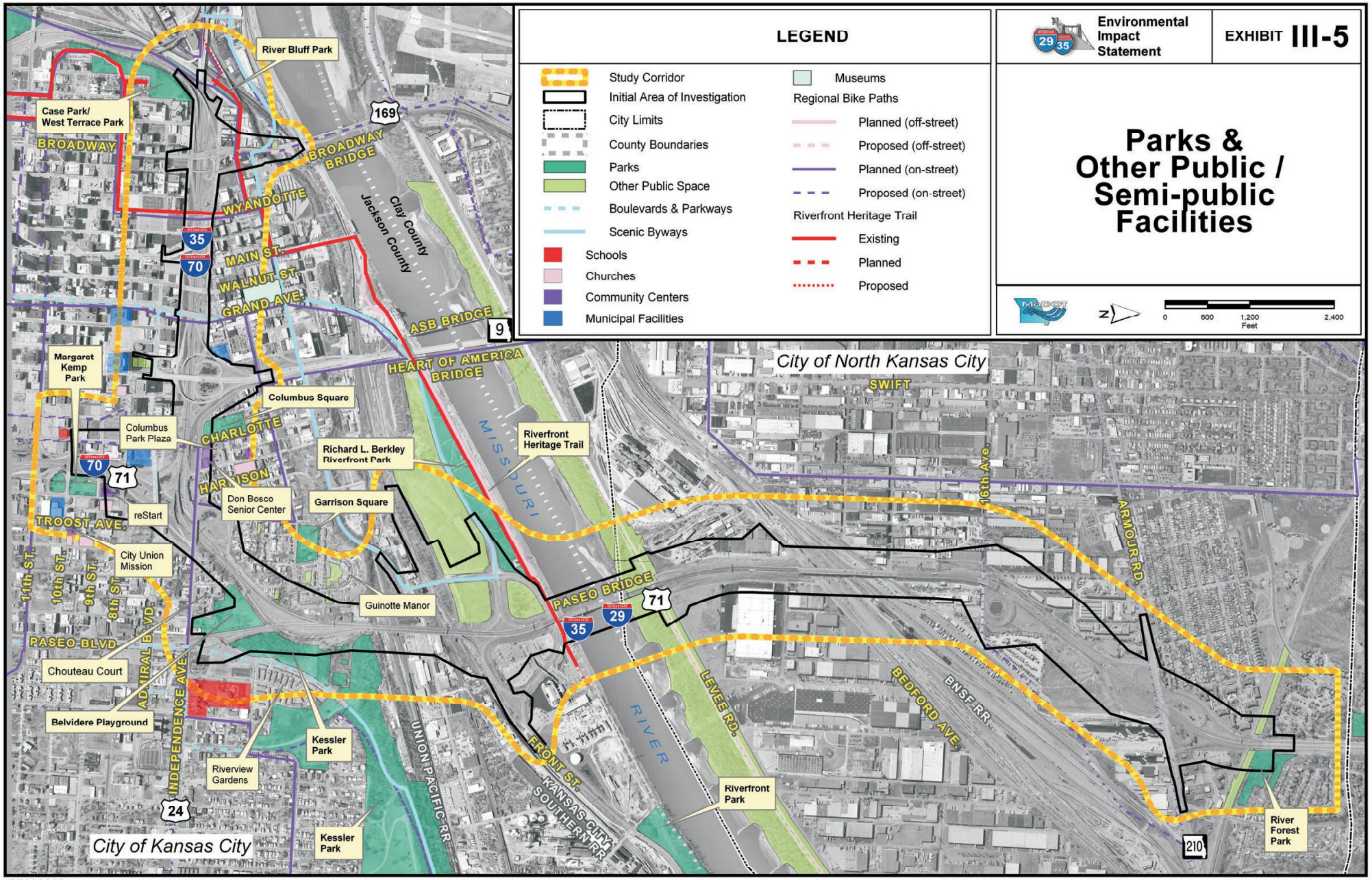
The Chapter III Exhibits for this Final EIS include:

- Exhibit III-1 Existing & Future Land Use & Neighborhoods
- Exhibit III-5 Parks & Other Public/Semi-public Facilities

Please note that only those Chapter III Exhibits with changes are included in this Final EIS.


LEGEND
Study Corridor
Initial Area of Investigation
City Limits
County Boundaries
Neighborhoods
Noise Modeling Site
Noise Measurement Site
FS-2
Existing Land Use
Single Family Residential
Vacant Residential
Condominium; Townhouse; Duplex
Multifamily (3 or more units)
Office
Commercial (Non-Office)
Hotel / Motel
Vacant Non-Residential
Heavy/General Industry
Light Industry
Public/Semi-Public/ Institution
Park
Other Open Space
Paved/Garage Parking
Railroad
Future Land Use
Office
Future LU Text
Note: Future land use is shown only where it differs from existing land use.
Environmental Impact Statement
EXHIBIT III-1
Existing & Future Land Use & Neighborhoods
0
600
1,200 Feet
2,400
Residential (Condos, etc.)
Quality Hill
Mixed-Use (Office, Comm., Res.)
BROADWAY
BROADWAY BRIDGE
CBD
WYANDOTTE
MAIN ST.
WALNUT ST.
GRAND AVE.
River Market
Jackson County
Clay
Office
Residential (Condos, etc.)
ASB BRIDGE
HEART OF AMERICA BRIDGE
BURLINGTON ST.
City of North Kansas City
SWIFT
Columbus Park Plaza
Guinotte Manor Public Housing
Mixed-Use (Office, Comm., Res.)
Mixed-Use (Office, Comm.)
CHARLOTTE
HARRISON
Columbus Park
reStart
Residential
Mixed-Use (Comm., Res.)
TROOST AVE.
Residential
11th St.
10th St.
9th St.
8th St.
PASEO BLVD.
Paseo West
Chouteau Courts Public Housing
Parkview
ADMIRAL BLVD.
INDEPENDENCE AVE.
Residential
Park
Park
Light Industrial
Pendleton Heights
Riverview Gardens Public Housing
UNION PACIFIC RR
FRONT ST.
KANSAS CITY SOUTHERN RR
RIVER
LEVEE RD.
PASEO BRIDGE
BEDFORD AVE.
BNSF RR
16th Ave.
ARMOUR RD.
The Avenues
Commercial
Sunny Hills
River Forest
City of Kansas City
FS-1
FS-2
FS-3
FS-4
FS-5
FS-6
FS-7
FS-8
FS-9
169
35
70
71
9
29
24
210

JULY 2006


LEGEND
Study Corridor
Initial Area of Investigation
City Limits
County Boundaries
Parks
Other Public Space
Boulevards & Parkways
Scenic Byways
Schools
Churches
Community Centers
Municipal Facilities
Museums
Regional Bike Paths
Planned (off-street)
Proposed (off-street)
Planned (on-street)
Proposed (on-street)
Riverfront Heritage Trail
Existing
Planned
Proposed
Environmental Impact Statement
EXHIBIT III-5
Parks & Other Public / Semi-public Facilities
0
600
1,200
2,400
Feet
River Bluff Park
Case Park/ West Terrace Park
BROADWAY
BROADWAY BRIDGE
169
WYANDOTTE
MAIN ST.
WALNUT ST.
GRAND AVE.
Clay County
Jackson County
ASB BRIDGE
9
Margaret Kemp Park
HEART OF AMERICA BRIDGE
Columbus Square
Columbus Park Plaza
CHARLOTTE
Richard L. Berkley Riverfront Park
Riverfront Heritage Trail
MISSOURI
HARRISON
Don Bosco Senior Center
Garrison Square
reStart
TROOST AVE.
City Union Mission
11th ST.
10th ST.
9th ST.
8th ST.
ADMIRAL BLVD.
PASEO BLVD.
Guinotte Manor
Chouteau Court
Belvidere Playground
INDEPENDENCE AVE.
Riverview Gardens
Kessler Park
Kessler Park
UNION PACIFIC RR
FRONT ST.
KANSAS CITY SOUTHERN RR
RIVER
LEVEE RD.
Riverfront Park
BEDFORD AVE.
BNSF RR
PASEO BRIDGE
71
29
35
70
24
210
City of Kansas City
City of North Kansas City
SWIFT
16th Ave.
ARMOUR RD.
River Forest Park

JULY 2006